

REMARKS

Applicants respectfully request reconsideration of this application as amended.

As a preliminary matter, in the Office Action mailed June 20, 2006, the Examiner did not attach an initialed copy of the PTO-1449 form references that were mailed to the PTO on 9/9/2003, 10/6/2003, 12/8/2003, 11/25/2003, and 1/11/2006. As such, applicant respectfully requests that the Examiner indicate that these references have been considered and made of record. The Examiner also did not indicate the references on said PTO-1449 form were not in conformance with MPEP 609. As such, applicant respectfully requests that the Examiner indicate that these references have been considered and made of record.

Office Action Rejections Summary

Claims 1 and 4 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting.

Claims 10 and 15 have been rejected under 35 U.S.C. §112, second paragraph.

Claims 1, 2, 8, 10-12, 17, 20 and 22 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Publication No. 2002/0025408 of Davis ("Davis").

Claims 3-6, 18 and 19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of U.S. Patent No. 5,956,216 of Chou ("Chou").

Claim 7 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou and further in view of U.S. Patent No. 6,309,580 of Chou.

Claims 9 and 21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of J. Vac. Sci. Technol. B, Vol. 18, No. 4, Jul/ Aug 2000 of Faircloth ("Faircloth").

Claims 13-16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis.

Claims 23-24 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou, Chou, and U.S. Patent No. 4,786,564 of Chen ("Chen").

Status of Claims

Claims 1-24 are pending in the application. Claims 1, 10, 18, 19 and 21 have been amended to more properly define a preexisting claim limitation. The amended claims are supported by the specification. No claims have been added. No new matter has been added. Claims 17 and 20 have been canceled.

Claim Rejections

Provisional Rejections

Claims 1 and 4 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 8 of copending Application No. 10/757,795. The applicant is filing a terminal disclaimer herewith to address this issue.

Rejections under 35 U.S.C. §112

Claim 10 has been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states: "As to Claim 10, it is unclear how this claim should be interpreted to be different than Claim 2, upon which it depends." (Office Action, 6/20/06, p. 3).

As amended, claim 10 recites: "further comprising preheating the resist film to the temperature before heating the stamper." Applicant asserts that as amended, claim 10 overcomes the rejection under 35 U.S.C. §112, second paragraph.

Claim 15 has been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states: "As to Claim 15, Claim 14 requires that the first temperature be higher, and Claim 15 contradicts Claim 14 by instead claiming that the resist is at both the second (Claim 14) and first (Claim 15) temperature." (Office Action, 6/20/06, p. 3)

In claim 14, the resist film is "separately heated to a second temperature below that of the first temperature." In claim 15, the resist film is "further heated to the first temperature." The Examiner is correct that the first temperature is higher than the second temperature. However, as specified in claim 15, the resist film is first heated to a second temperature, then further heated to a first temperature. Claim 14 does not include the limitation of further heating to the first temperature. Therefore, the applicant respectfully requests that the Examiner remove his rejection under 35 U.S.C. §112, second paragraph.

Rejections under 35 U.S.C. §102(b)

Claims 1, 2, 8, 10-12, 17, 20 and 22 have been rejected under 35 U.S.C. §102(b) as being anticipated by Davis.

Regarding claim 1, the current Office Action states that, "Davis teaches a method comprising ... cooling the resist film after separating (inherent in that other operations are subsequently performed)". (Office Action, 6/20/06, pp. 3-4). The applicant has amended claim 1 to more clearly point out existing limitations and to address the Examiner's concerns.

As amended, claim 1 recites a method, comprising:

heating a stamper and a resist film;
imprinting the stamper into the resist film;
separating the stamper from the resist film before there is
any substantial cooling of the resist film; and
cooling the resist film after the separating.

In the interview summary based on the phone interview of September 27, 2006, the examiner stated:

Applicant's counsel provided the enclosed claim amendments for discussion. First, the Examiner argued that the word "substantial" would likely result in a rejection under 35 USC 112, second paragraph as being indefinite. Additionally, applicants counsel pointed to the last sentence of paragraph [0075] for teaching of typically cooling the molded substrate prior to removal of the mold. The Examiner responded that the remainder of paragraph [0075] teaches that temperature is a result effective variable that should be optimized. The examiner asserted that of the two teachings, the Examiner's interpretation is the broadest reasonable interpretation, and reads on the claim.

(Interview Summary, 10/2/06, page 3).

The applicant respectfully submits that such a reading of paragraph [0075] of Davis is inapposite. The applicant asserts that paragraph [0075] of Davis discloses that the substrate is placed in the mold (first sentence), the substrate temperature is modified as necessary to emboss the mold (second sentence), and finally the substrate is cooled before removing it from the mold to ensure surface integrity (third sentence). (Davis, page 8, paragraph [0075]).

Paragraph [0075] of Davis discloses the temperature during three phases involved in embossing: temperature at initial contact, temperature during contact, and temperature at removal. The temperature being optimized by Davis is the temperature during which the substrate maintains contact with the mold. Regardless of how the temperature is optimized during the contact phase though, Davis still teaches that the substrate and mold must be cooled down before the substrate is removed from the mold.

Davis discloses that typically the mold and the substrate are to be cooled to a temperature below the glass transition temperature before removal. (Davis, page 8, paragraph [0075]). The Examiner interpreted this statement to mean that typically the mold and substrate are cooled, but that in some instances cooling does not occur prior to removal. The applicant respectfully asserts that this is an incorrect reading of the third sentence of paragraph [0075] of Davis. It is submitted that paragraph [0075] of Davis discloses that typically the substrate and mold are cooled to a specific temperature (below the glass transition temperature), but they may be cooled to different temperatures before removing the substrate from the mold.

Davis does not disclose separating the stamper from the resist film before there is any substantial cooling of the resist film. Since Davis does not disclose separating the stamper from the resist film before there is any substantial cooling of the resist film, as required by claim 1, the applicant respectfully asserts that

claim 1 is in condition for allowance and requests that the Examiner remove his rejection under 35 U.S.C. §102(b).

It is respectfully submitted the term "substantial" as used in claim 1 is definite. Relative terms such as "substantial" are appropriate where the specification and/or the prior art provides a standard for ascertaining the requisite degree, and one of ordinary skill in the art would be reasonably apprised of the scope of the invention. (MPEP 2173.05(b) Relative Terminology). Both Davis and the specification of the present application discuss temperature in relation to a glass transition temperature. One of ordinary skill in the art would understand the meaning of the phrase "substantial cooling" in light of the relative temperatures involved between the stamper and the resist film with regard to glass transition temperatures. Therefore, the specification and the prior art provides sufficient disclosure to enable one who is skilled in the art to understand the meaning of the term substantial as used in claim 1.

Claim Rejections under 35 U.S.C. §103(a)

Claims 3-6, 18 and 19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou. Claim 7 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou and further in view of Chou. Claims 13-16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis. Claims 23-24 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou, Chou, and Chen. Claims 9 and 21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Faircloth.

Claim 21 has been rewritten in independent format to include all the limitations of its original base claim 17. Claim 21 as amended recites a method, comprising:

heating a stamper and a resist film to a first temperature at least that of a transition temperature of the resist film, **wherein the resist film comprises a plurality of resist layers;**
imprinting the stamper into the resist film;
cooling the resist film to a second temperature above room temperature; and
separating the stamper from the resist film.

(emphasis added).

The Examiner stated in the current office action that:

Davis teaches the subject matter of Claims 1 and 17 above under 35 USC 102(b). As to Claims 9 and 21, Davis appears to be silent to the multilayer resist. However, Faircloth teaches that bilayer resists are conventional in nanoimprint lithography (see the entire document). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Faircloth into that of Davis **because single layer resists are known to be problematic**, and because doing so would provide higher resolution arrays of particles, lines, and crosshatches (Faircloth, right column).

(Office Action, 6/20/06, p. 6) (emphasis added).

Faircloth discloses that “single layer resists are problematic **when transferring a pattern via metal liftoff.**” (Faircloth, page 1, paragraph 3). Davis does not disclose transferring patterns using metal liftoff. Since Faircloth teaches that bilayer photoresists are used to solve a problem that occurs only when transferring a pattern via metal liftoff, and Davis does not perform metal liftoff, there was no motivation in the art at the time of the present invention to add the teachings of Faircloth to Davis. The applicant respectfully submits that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so in the prior art. (MPEP 2143.01 Suggestion or Motivation to Modify the References). Since such a motivation was lacking, the

applicant respectfully submits that claim 21 as amended is in condition for allowance and requests that the Examiner remove his rejection under 35 U.S.C. §103(a).

Not any of Chou, Chou, Faircloth, or Chen teach or suggest the limitations of claims 1 and 21 that are missing from Davis. Therefore, neither Davis, Chou, Chou, Faircloth, or Chen, alone or in combination, teach or suggest all of the limitations of claims 1 and 21. Claims 2-16 and 22-25 depend from, and therefore include, all of the limitations of claim 1, and claims 18 and 20 depend from, and therefore include, all of the limitations of claim 21. Accordingly, the applicant respectfully requests that the Examiner remove his rejections to claims 3-7, 9, 13-16, 18, 19, 21, and 22-24 under 35 U.S.C. §103(a).

In conclusion, applicants respectfully submit that in view of the arguments and amendments set forth herein, the applicable rejections have been overcome.

If the Examiner believes a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Benjamin Kimes at (408) 720-8300.

If there are any additional charges, please charge our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: 10/19, 2006


Benjamin Kimes
Registration No. 50,870


12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8300

FIRST CLASS CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to Commissioner for Patents, PO Box 1450, Alexandria, Virginia 22313-1450.

on 10-19-06
Date of Deposit

Joyce Klein
Name of Person Mailing Correspondence


Signature

10-19-06
Date